UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,687	06/23/2003	Thomas C. Russell	M02A442	7982

20411 7590 05/13/2008

THE BOC GROUP, INC.
575 MOUNTAIN AVENUE
MURRAY HILL, NJ 07974-2064

EXAMINER	
GAMI, TEJAL	
ART UNIT	**PAPER NUMBER**
2121	
MAIL DATE	**DELIVERY MODE**
05/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/601,687	RUSSELL ET AL.	
	Examiner	Art Unit	
	TEJAL J. GAMI	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12 and 14-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12 and 14-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This office action is responsive to an AMENDMENT entered December 28, 2007 for the patent application 10/601687.

Status of Claims

2. Claims 1-20 were rejected in the last Office Action dated July 02, 2007.

As a response to the July 02, 2007 office action, Applicant has Amended claims 1, 5-10, 12, 19, and 20; Cancelled claims 11 and 13; and Added claims 21-23.

Claims 1-10, 12, and 14-23 are now pending in this office action.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-10, 12, and 14-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Niemela et al. ("Embedded middleware: State of the art" VTT Electronics, Technical Research Centre of Finland, ESPOO 1999).

As to independent claim 1, Niemela discloses in an industrial equipment network for interconnecting a plurality of devices (e.g., plant floor devices) (see Page 43, First Paragraph), apparatus for permitting an associated SCADA system (e.g.,

SCADA or DCS) (see Page 43, Fifth Paragraph) to be self-configuring (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph), comprises:

a plurality of controllers dedicated to each one of said plurality of devices (e.g., OLE for process control…plant floor devices) (see Page 43, First Paragraph), respectively, for providing each with control and data functions for interacting with other of the devices in the equipment network, and other systems (see Page 18, Section 2.2.1 LAN and WAN), wherein each one of said plurality of devices includes device configuration means for creating or updating device configuration data (e.g., creating data access in a manufacturing environment) (see Page 43, First Paragraph), the device configuration data including description of the device and representation of interconnection and interaction of the device with other ones of said plurality of devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

a computer network (see Page 18, Section 2.2.1 LAN and WAN);

means connected between said computer network and said plurality of controllers, respectively, for transferring data and/or control signals between individual ones of said plurality of controllers and said computer network at given times (e.g., OLE for process control…plant floor devices) (see Page 43, First Paragraph); and

auto-discovery means (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph) for permitting said SCADA system to both self-configure itself relative to devices in said industrial equipment network (e.g., device details about how the server

physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph), and to be updated relative to changes in the configuration of said industrial equipment, and associated devices or equipment therein, including discovering new or changed devices via communication of the device configuration data over said computer network (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph).

As to independent claim 7, Niemela discloses a method for permitting a Supervisory Control and Data Acquisition system (e.g., SCADA or DCS) (see Page 43, Fifth Paragraph) to automatically diagram the interconnection and interaction (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph), and changes thereto, between a plurality of pieces of industrial equipment and/or a plurality of devices that may be connected to one another and to a data network (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph), said method comprising:

configuring said plurality of pieces of industrial equipment and/or devices using a configuration tool included in each of said plurality of pieces of industrial equipment and/or devices (e.g., OLE for process control) (see Page 43, First Paragraph), the configuration tool creating or updating device configuration data (e.g., creating data access in a manufacturing environment) (see Page 43, First Paragraph) including description of the piece of industrial equipment and/or device and representation of the interconnection and interaction thereof with other ones of said plurality of pieces of

industrial equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

establishing a network over which said plurality of pieces of industrial equipment (e.g., plant floor devices) (see Page 43, First Paragraph) and/or devices can selectively communicate with one another and with a SCADA system (e.g., SCADA or DCS) (see Page 43, Fifth Paragraph);

connecting different ones of said plurality of pieces of industrial equipment and/or devices each to either a common controller, or each to individual dedicated controllers, respectively, or each to a plurality of controllers, or some combination thereof (e.g., OLE for process control…plant floor devices) (see Page 43, First Paragraph); and

programming each controller for controlling and identifying its associated piece of industrial equipment and or device (e.g., code written…devices and data are named) (see Page 43, Third Paragraph), and for sending the device configuration data both to the other ones of said plurality of pieces of industrial equipment and/or devices, and to said SCADA system over said data network (e.g., transferred into and from the SCADA or DCS) (see Page 43, Fifth Paragraph).

As to dependent claim 2, Niemela teaches the apparatus of claim 1, wherein said plurality of controllers are each provided by a programmable logic controller (e.g., Psion Software PLC) (see Page 103, Appendix A. Operating Systems for Embedded Systems).

As to dependent claim 3, Niemela teaches the apparatus of claim 1, wherein said transfer means is selected from the group consisting of a router, and switch (e.g.,

Frame Relay can route over existing routers) (see Page 18, Section 2.2.1 LAN and WAN).

As to dependent claim 4, Niemela teaches the apparatus of claim 1, wherein said computer network consists of a local area network (see Page 18, Section 2.2.1 LAN and WAN).

As to dependent claim 5, Niemela teaches the apparatus of claim 1, wherein said auto-discovery means (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph) includes:

broadcast means for operating a controller of a given device, that has either changed its configuration or is new to said industrial equipment network, to broadcast over said computer network an auto-discovery protocol (e.g., hardware autodiscovery) (see Page 24 and 27, Last Paragraph); and

server means included in said SCADA system responsive to an auto-discovery protocol from said given device (e.g., OPC servers) (see Page 43, Section 2.4.9 OPC), for requesting said controller of said given device for the device configuration data to permit said SCADA system to update its configuration for the given device itself and within the industrial equipment network (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph).

As to dependent claim 6, Niemela teaches the apparatus of claim 1, wherein said auto-discovery means (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph) includes:

server means included in said SCADA system and connected to said computer network (e.g., OPC servers) (see Page 43, Section 2.4.9 OPC), for in a first mode of operation periodically polling respective controllers of all of said plurality of devices in said industrial equipment network for any respective changes in configuration and identification of new ones of said plurality of devices (e.g., polling) (see Page 37, Asynchronous invocation), and in a second mode of operation individually requesting each responding one of said plurality of devices for the device configuration data to permit said SCADA system to update its configuration information (e.g., async event notification) (see Page 37, Asynchronous invocation).

As to dependent claim 8, Niemela teaches the method of claim 7, further including the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network (e.g., plug-and-play) (see Page 24, Last Paragraph);

broadcasting onto the data network an auto-discovery protocol including the associated IP address from each piece of equipment or device when it is added to the network, or thereafter when a change is made to its interconnections and interaction with other of said plurality of pieces of equipment, and/or devices (e.g., broadcast to all the computers in the domain) (see Page 33, Last Paragraph);

acknowledging via a server of said SCADA system the receipt of an auto-discovery request (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph);

transferring to said server the device configuration data of the associated piece of equipment or device, to permit said SCADA system to configure monitoring (e.g., transferred into and from the SCADA or DCS) (see Page 43, Fifth Paragraph);

operating said SCADA system to automatically monitor either by polling or receiving broadcasts from said piece of equipment or device (e.g., transferred into and from the SCADA or DCS) (see Page 43, Fifth Paragraph); and

programming said SCADA system to automatically update and include the associated piece of equipment or device in a diagram identifying and showing each (e.g., code written…devices and data are named) (see Page 43, Third Paragraph), and their interaction with other ones of said plurality of pieces of equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph).

As to dependent claim 9, Niemela teaches the method of claim 7, wherein an extensible mark-up language is used to represent the device configuration data (e.g., Standard Generalised Markup Language SGML) (see page 44, Section 2.5 Web client/server).

As to dependent claim 10, Niemela teaches the method of claim 7, further including the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network (e.g., plug-and-play) (see Page 24, Last Paragraph);

programming a server in said SCADA system to periodically poll said plurality of pieces of industrial equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

operating a controller of each polled device or piece of industrial equipment to respond to a discovery request from said server by providing the device configuration data thereof (e.g., broadcast to all the computers in the domain) (see Page 33, Last Paragraph); and

operating said server to use the device configuration data to configure monitoring of the associated device or piece of industrial equipment, whereafter device or equipment monitoring begins (e.g., device and data to which each server has access) (see Page 43, Third Paragraph).

As to dependent claim 12, Niemela teaches the method of claim 7, further including the steps of:

configuring each dedicated controller (e.g., OLE for Process Control) for having its associated device or piece of industrial equipment interconnect and interact with selected other ones of said plurality of pieces of industrial equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

operating each controller for connecting its associated device or piece of equipment to said network (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph);

operating each controller to respond to a request from said server to provide the device configuration data of the associated device and/or piece of equipment (e.g., broadcast to all the computers in the domain) (see Page 33, Last Paragraph);

operating said server, in response to the device configuration data, to initially establish and thereafter update a database and a user interface of said SCADA system (see Page 73, Section 2.7.4 Database interfaces); and

operating said server to begin monitoring the associated device (e.g., device and data to which each server has access) (see Page 43, Third Paragraph).

As to dependent claim 14, Niemela teaches the method of claim 12, further including in said step of operating each controller and a server in said SCADA system for providing auto-discovery (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph), the steps of:

measuring the time for said server to respond to a controller of a device or piece of equipment awaiting a reply (e.g., transactions or messages per second) (see Page 95, Section 5.2 Basic services), and indicating a network fault (e.g., mean time to failure and mean time to repair) (see Page 95, Section 5.2 Basic services), and interrupting further SCADA system processing for the associated device or piece of equipment, if no reply is received within a predetermined period of time (e.g., restrictions for response times) (see Page 98, Last Paragraph).

As to dependent claim 15, Niemela teaches the method of claim 7, further including the steps of:

configuring each dedicated controller for having its associated device or piece of industrial equipment interconnect and interact with selected other ones of said plurality of pieces of industrial equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph);

operating each controller for connecting its associated device or piece of equipment to said network (e.g., OLE for Process Control) (see Page 43);

operating each controller to request a reply from a respective controller of each selected one of other of said plurality of devices and/or pieces of equipment (e.g., request/reply) (see Page 21, Section 2.3 Operating systems);

operating each controller to wait for a reply (e.g., waits for the reply) (see Page 55, Section 2.6.1 Synchronous communication); and

operating a requesting controller in response to a reply from another controller to provide the latter with data for updating a database of its associated device or piece of equipment with identification and interconnection data associated with the device or piece of equipment of the requesting controller (see Page 73, Section 2.7.4 Database interfaces).

As to dependent claim 16, Niemela teaches the method of claim 15, wherein said step of operating each controller to wait for a reply further includes the steps of:

measuring the time from making a request for reply to the receipt of a reply (e.g., transactions or messages per second) (see Page 95, Section 5.2 Basic services); and

indicating a network fault and interrupting further processing if no reply is received within a predetermined period of time (e.g., mean time to failure and mean time to repair) (see Page 95, Section 5.2 Basic services).

As to dependent claim 17, Niemela teaches the method of claim 12, further including the steps of:

operating each controller to request a reply from a respective controller of each selected one of other of said plurality of devices and/or pieces of equipment (e.g., request/reply) (see Page 21, Section 2.3 Operating systems);

operating each controller to wait for a reply (e.g., waits for the reply) (see Page 55, Section 2.6.1 Synchronous communication); and

operating a requesting controller in response to a reply from another controller to provide the latter with data for updating a database of its associated device or piece of equipment with identification and interconnection data associated with the device or piece of equipment of the requesting controller (see Page 73, Section 2.7.4 Database interfaces).

As to dependent claim 18, Niemela teaches the method of claim 17, wherein said step of operating each controller to request contact from a respective controller of each one of said plurality of devices and/or pieces of equipment, further includes the steps of:

measuring the time from making a request for reply to the receipt of a reply (e.g., transactions or messages per second) (see Page 95, Section 5.2 Basic services); and

indicating a network fault and interrupting further processing if no reply is received within a predetermined period of time (e.g., mean time to failure and mean time to repair) (see Page 95, Section 5.2 Basic services).

As to dependent claim 19, Niemela teaches the method of claim 12, wherein said step of operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph), further includes the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network (e.g., plug-and-play) (see Page 24, Last Paragraph);

broadcasting onto the data network an auto-discovery protocol including the associated IP address from each piece of equipment or device when it is added to the network, or thereafter when a change is made to its interconnections and interaction with other of said plurality of pieces of equipment, and/or devices (e.g., broadcast to all the computers in the domain) (see Page 33, Last Paragraph);

acknowledging via a server of said SCADA system the receipt of an auto-discovery request (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph);

requesting via said server the device configuration data of the associated piece of equipment or device, to permit said SCADA system to configure monitoring (e.g., device and data to which each server has access) (see Page 43, Third Paragraph);

operating said SCADA system to automatically monitor said piece of equipment or device (e.g., OLE for Process Control) (see Page 43); and

programming said SCADA system to automatically update and include the associated piece of equipment or device in a diagram identifying and showing each (e.g., code written…devices and data are named) (see Page 43, Third Paragraph), and their interaction with other ones of said plurality of pieces of equipment and/or devices (e.g., device details about how the server physically accesses the data..define connections) (see Page 43, Third and Fourth Paragraph).

As to dependent claim 20, Niemela teaches the method of claim 12, wherein said step of operating each controller and a server in said SCADA system for providing auto-discovery by the latter of each device and/or piece of equipment (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph), further includes the steps of:

assigning a unique IP address to each one of said plurality of pieces of industrial equipment and/or devices upon their request as they are connected to the network (e.g., plug-and-play) (see Page 24, Last Paragraph);

programming a server in said SCADA system to periodically broadcast a discovery request poll to said plurality of pieces of industrial equipment and/or devices (e.g., broadcast to all the computers in the domain) (see Page 33, Last Paragraph);

operating a controller of each polled device or piece of industrial equipment to respond to a discovery request from said server by providing the device configuration data thereof (e.g., autodetecting hardware) (see Page 24 and 27, Last Paragraph); and

operating said server to use the device configuration data to configure monitoring of the associated device or piece of industrial equipment, whereafter device or equipment monitoring begins (e.g., device and data to which each server has access) (see Page 43, Third Paragraph).

As to dependent claim 21, Niemela teaches the apparatus of claim 1, wherein the device configuration means includes a configuration tool for allowing a user to enter operating parameters of the device, and creating a device configuration file based on the operating parameters (e.g., interface parameters) (see Page 32, Fifth Paragraph; and Page 34, Second Paragraph).

As to dependent claim 22, Niemela teaches the apparatus of claim 21, wherein the device configuration file is organized as a hierarchy (see Page 14, Section 2.1.1 2-tier and 3-tier client/server architectures).

As to dependent claim 23, Niemela teaches the apparatus of claim 1, wherein the plurality of controllers are configured such that the device configuration data, in its entirety, is communicated to said SCADA system while only relevant part of the device configuration data is communicated to other ones of said plurality of devices in the equipment network (e.g., vendor determines the devices to which each server has access..the client can define one or more OPC Items which represent connections to

data sources..data can be transferred into or from the SCADA or DCS) (see Page 43, Section 2.4.9 OLE for Process Control).

Response to Arguments

5. Applicant's arguments filed December 28, 2007 are moot in light of new grounds of rejections.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Zecevic "Web based interface to SCADA system" Electric Power Company of Serbija, IEEE 1998.

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tejal J. Gami whose telephone number is (571) 270-1035. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert DeCady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TJG/

/Ryan A. Jarrett/
Primary Examiner, Art Unit 2121